SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report
Proposed Rule 1430 – Control of Emissions from Metal Grinding Operations at Metal Forging Facilities

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INTRODUCTION

The South Coast Air Quality Management District (SCAQMD) is the lead air pollution agency in the South Coast Air Basin (SCAB) and has jurisdiction over all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD performs inspections of more than 27,000 facilities in the Basin, in addition to responding to public complaints regarding air quality.

Proposed Rule 1430 is designed to reduce emissions from metal grinding and metal cutting operations at forging facilities. Both metal grinding and cutting operations are currently exempt from SCAQMD permits, and as such operations are currently an unregulated source category. Although some of the metal grinding operations have air pollution controls, most are not permitted. The issue of grinding emissions at forging facilities was brought to the attention of the SCAQMD based on community complaints regarding odors and visible emissions near a forging facility in the City of Paramount. Based on investigations, the SCAQMD staff identified fugitive metal particulate emissions from Carlton Forge Works' (CFW) grinding operation and the need to control these emissions. During the development of Proposed Rule 1430, staff visited other metal forging facilities throughout the Basin. Similar to CFW, staff found that other forging facilities lacked necessary pollution controls to manage point and fugitive emissions from their metal grinding and cutting operations. Depending on the metal alloys, some metal particulate can be toxic air contaminants posing a potential health risk to the surrounding community if emissions are not well controlled. Proposed Rule 1430 will ensure metal particulate emissions are appropriately vented to pollution control equipment, fugitive emissions are contained within a building enclosure, and housekeeping measures are implemented to further minimize emissions from metal grinding and metal cutting operations at metal forging facilities.

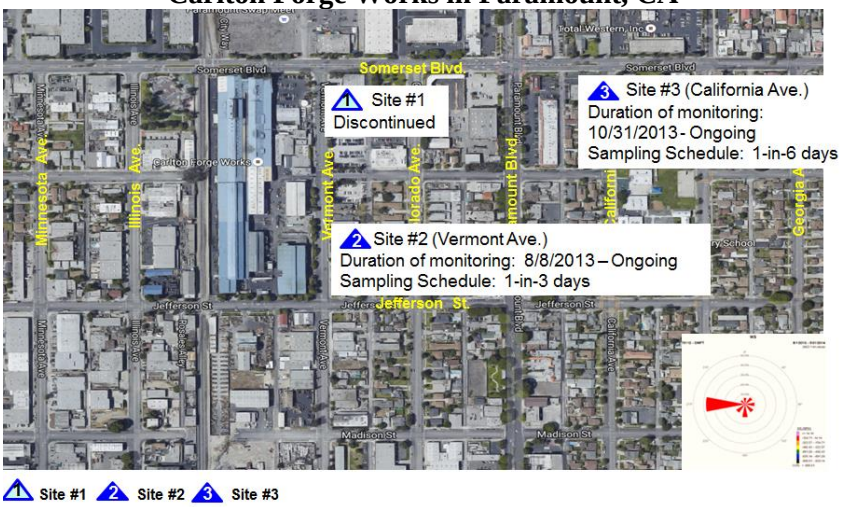
BACKGROUND

In 2012, the SCAQMD began receiving complaints from the public regarding a burning metallic odor and metal particulate in the City of Paramount. Through air quality analysis and investigation of surrounding businesses, Carlton Forge Works (CFW) was identified as a source of these metallic odors, which arise primarily from their metal grinding operations. CFW manufactures forged high-temperature alloy rings for aerospace, gas turbine, and other industries, using metals such as stainless steel, nickel, titanium, aluminum, cobalt, and iron, as well as other high temperature metals with special properties. CFW operates a large grinding room with 25 grinding booths, each equipped with a handheld air grinder or a swing grinder and vented to one of three pieces of air pollution control equipment (baghouses).

In August 2013, the SCAQMD staff began ambient air monitoring at three locations near of CFW to measure the levels of various metals. Figure 1-1 below shows an aerial map of the three ambient air monitors in relation to the CFW facility and the nearby community. Sites #1 and #2 identified in Figure 1-2 are located on Vermont Avenue and represent exposures immediately downwind of CFW. Site #1 was only active August 2, 2013 through October 1, 2013 due to access limitations. Site #2 and #3 began sampling on August 8, 2013 and October 31, 2013, respectively, and are currently collecting samples as of this writing. The sampling schedules are consistent with many of the toxics air monitoring programs conducted by SCAQMD. The

ambient air monitors measure metals from all nearby sources, including CFW and other metal processing facilities, as well as regional background emissions. Based on a review of the air monitoring results, the two main metals of concern, given their toxicity, were nickel and hexavalent chromium.

Figure 1-1: Aerial Map of Ambient Air Monitoring Downwind Carlton Forge Works in Paramount, CA



Nickel and hexavalent chromium levels from Site #3 were generally consistent with background levels based on SCAQMD's Multiple Air Toxics Study (MATES) IV. When monitoring began in 2013, nickel levels at Site #2 were elevated as shown in Figure 1-2. As CFW implemented a series of voluntary measures to reduce emissions from their grinding operations beginning in late September 2013, nickel levels decreased. Voluntary measures implemented at CFW are summarized in Figure 1-3 below.

Figure 1-2: Nickel (ng/m^3) from Site #2

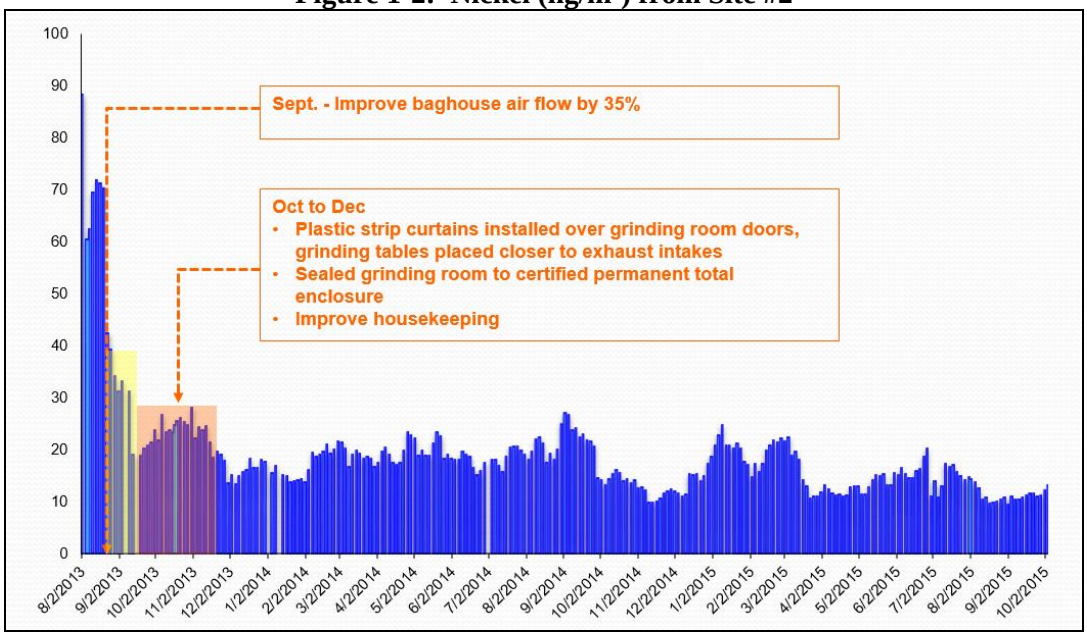
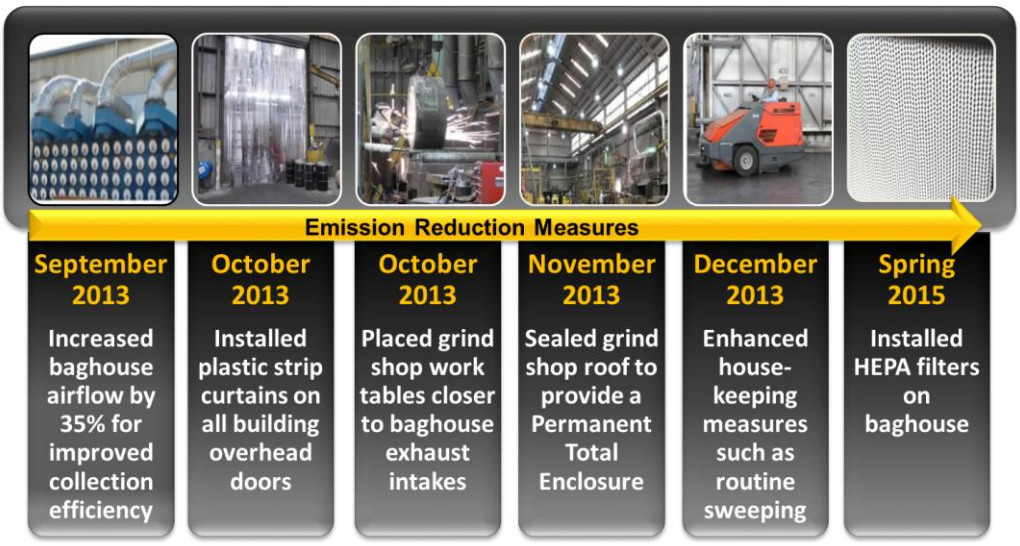


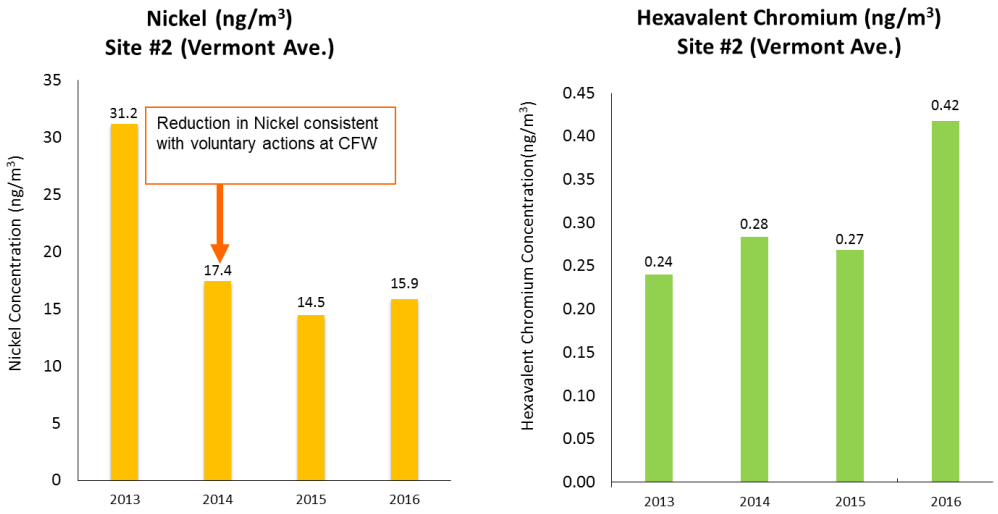
Figure 1-3: Measures Implemented at CFW



As shown in Figure 1-4, average hexavalent chromium levels at Site #2 did not follow the same pattern as the nickel levels. For example, where the nickel levels decreased after 2013, hexavalent chromium levels did not, which indicated that hexavalent chromium could be originating from an operation other than grinding within CFW or possibly a different facility. In addition, in 2016 Site #2 showed an increase in hexavalent chromium levels. As a result, SCAQMD staff began investigating potential sources of hexavalent chromium at CFW as well as other facilities that could be contributing to the increase.

As part of its efforts to understand the hexavalent chromium levels found at Site #2, in October 2016, SCAQMD staff expanded its air monitoring efforts and found elevated levels of hexavalent chromium near CFW that were less than 1 ng/m^3, but still at a level where additional investigation is needed. SCAQMD staff temporarily suspended its investigation near CFW, as resources were needed to address substantially higher levels of hexavalent chromium that were found further south of CFW. The SCAQMD will be resuming the investigation of source(s) of hexavalent chromium near CFW, and if needed, additional controls will be addressed in a future rule development effort. More details regarding air monitoring near CFW and in the City of Paramount can be found at: http://www.aqmd.gov/home/regulations/compliance/air-monitoring-activities.

Figure 1-4:
Average Nickel and Hexavalent Chromium Levels (ng/m^3) at Site #2



SAMPLING FROM OTHER METAL FORGING FACILITIES

In addition to the sampling and monitoring done at Carlton Forge Works, SCAQMD staff conducted glass plate sampling on-site at Press Forge, Weber Metals, Inc. and Schlosser Forge. Glass plates are typically left at location for a period 7 consecutive days. Although the deposition plate results cannot determine ambient concentrations, they provide a good indication of gradients and the extent of potential off site impacts. Glass plates sampling was conducted at Schlosser Forge, Press Forge, and Weber in May 2014.

Glass plates were placed near buildings or roof tops where grinding operations were occurring to collect metal particulate. The results of the glass plate samples showed that PM concentrations from the three other forging facilities were as substantial or more substantial, than the PM concentrations found at CFW prior to implementing measures to reduce emissions from their grinding operation. The glass plate samples also confirmed the presence of a variety of metal particulates, some of which are toxic such as arsenic and nickel. The glass plate samples also showed the presence of chromium, but did not distinguish the type of chromium such as hexavalent or trivalent chromium.

The mass concentrations of metals observed at Weber Metals and Press Forge demonstrated similar results to CFW. All three sites had significant mass concentrations of heavy metals. The highest concentrations were detected on the roof of Press Forge's grinding station. Weber Metals also had high concentrations of heavy metals with values exceeding those measured at CFW. The presence of heavy metals in high concentrations at other metal forging facilities indicate that fugitive metal particulates were not exclusive to grinding operations at CFW.

Figure 1-5
Glass Plate Sampling at Metal Forging Facilities (2014)

	Location Description	As	Ba	Ca	Cd	Co	Cr	Cu	Fe	K	Mn	Mo	Ni	Pb	Sb	Sn	Sr	Ti	V	Zn
Carlton Forge	Roof of grinding room	6.81	418	18,500	2.12	555	607	665	35,300	6,220	430	217	3,340	89.8	7.98	33.1	181	2,320	134	1,300
	West side of roof of saw bldg	6.98	491	19,300	2.37	761	815	815	33,500	7,260	449	287	4,500	130	9.71	31.9	205	2,390	130	1,330
	East side of roof of saw bldg	7.09	521	18,000	2.43	556	661	624	26,200	6,870	391	279	3,620	94.3	9.53	31.2	215	2,470	118	1,500
	Roof of Residence across street from facility	7.63	547	21,700	1.99	258	358	746	27,100	7,690	438	149	1,750	133	10.3	42.8	185	2,290	96.8	1,270
	Top of fence along perimeter of parking lot	8.29	583	20,700	1.51	146	234	271	28,200	8,810	470	89.8	1,020	99.6	14.3	30.7	207	2,120	82.1	1,140
Weber Metals	Site #1 Roof of Bldg O	16.3	513	34,400	1.66	17.1	98.4	450	28,000	12,000	467	37.3	172	91.2	9.24	20.4	229	2,730	302	1,720
	Site #2 Open area next to tracks	17.4	2,370	35,100	1.39	17.6	160	578	71,500	12,500	637	35.5	215	98.7	6.92	21.8	272	2,720	237	1,630
	Site #4 Top of Transformer at North perimeter of facility	10.5	453	29,500	1.89	18.7	310	731	42,300	7,200	454	163	862	100	10.9	74.3	241	8,710	568	2,110
	Site #5 Roof of Bldg P	9.62	521	28,600	1.53	20.9	224	632	36,100	9,160	606	67.2	508	99.8	8.54	35.1	204	12,500	736	1,790
	Site #6 Top of Patio adjacent to Bldg L	6.98	575	31,100	2.37	13.5	86.8	654	27,700	7,060	398	23.8	151	211	87.5	89.8	184	1,850	75.8	2,080
	Site #7 Roof of storage shed at Promise Hospital	18.3	495	14,300	3.14	48.9	1,990	997	161,000	6,690	1,130	995	5,810	89.3	12.1	77.6	167	10,200	683	864
Press Forge	Site #1 Roof of outside grinding station	6.61	59.3	5,780	4.67	1,340	5,070	722	194,000	1,710	1,190	1,640	18,200	15.3	0.08	6.1	63.3	7,150	774	154
	Site #2 Roof of larger outside grinding station	8.46	38.2	3,080	6.53	791	5,140	786	197,000	1,010	1,230	2,290	18,600	14.7	0.15	7.7	51.5	7,030	919	81.1
	Site #3 Adjacent to Forge Building	12.5	333	17,200	2.4	60.1	1,170	364	116,000	4,980	835	634	4,110	55.2	5.4	85	153	9,770	794	746
	Site #4 Adjacent to 2nd Forge Building	9.65	481	20,600	2.6	36.2	224	247	39,100	8,570	532	125	757	618	9.3	503	183	2,840	136	1,170
	Site #5 North Perimeter of facility	9.73	527	20,300	3.26	31.3	181	437	32,700	7,910	473	55.1	430	414	10.3	18	179	2,510	109	1,150
	Site #6 Adjacent to Eng Building	11.2	344	19,900	2.64	34.1	711	292	79,400	5,650	707	380	2,730	81.3	6.9	62	164	6,220	440	894
	Site #7 Storage shed at Promise Hospital	13.9	430	20,400	3.66	83.2	1,260	468	105,000	7,070	838	769	4,340	70	8.6	112	184	9,510	643	769
Schlosser	Admin Bldg roof	38.4	591	25,062	3.4	329	574	641	44,791	7,607	1133	667.8	2040	106.4	12.2	31	189	1,965	85.02	1,884
	Roof of container adjacent to bldg 4	15.3	450	27,871	4.35	1797	2785	635	59,792	6,288	1170	1505.7	12434	90.78	5.33	20.2	181	2,716	142.9	1,861
	Southeast end of grinding room	20.5	444	25,233	2.65	1072	774	503	36,556	6,027	1084	527.36	7277	107.1	9.97	21.5	213	2,073	99.48	1,751
	Southeast end of grinding room adjacent to emission contr	12.2	248	14,636	4.46	8657	6983	371	27,754	3,531	546	2195.6	58462	48.88	3.81	9.37	148	2,661	149.4	1,035
	On top of modular between bldgs 2 and 3	11.2	243	19,163	3.74	4540	3742	483	34,852	3,631	599	1758.1	31059	46.04	2.3	10	124	1,988	148.3	1,477

NEED FOR PROPOSED RULE 1430

Metal grinding and metal cutting operations are currently exempt from permitting by the SCAQMD and is currently an unregulated source. Through the rule development process, the SCAQMD has obtained additional information about metal grinding and metal cutting operations at forging facilities. As a result, some facilities are currently conducting metal grinding and metal cutting operations with no pollution controls. Other facilities that have pollution controls, are not properly operating and maintaining their pollution controls. During the rule development process, SCAQMD staff has visited many of the forging facilities that will be subject to Proposed Rule 1430. The following are key findings from the site visits:

- Prior to November 2016, there were four facilities that were conducting metal grinding operations in the open air. Because of the fugitive nature of grinding operations, with no containment structure such as an enclosure and no air pollution control device, the metal particulates were being released in the open air and into the community. One of the three facilities recently moved their grinding operations within a building enclosure and is in the process of constructing a total enclosure. Another one of the facilities is in the process of moving their grinding operations within an enclosure also.
- Although air pollution controls were not previously required by the SCAQMD, 14 forging facilities currently have some type of air pollution control device. However, many baghouses did not appear to have proper ventilation, operation, and maintenance of pollution controls.
- Housekeeping measures varied at each facility. There was variation in the cleaning method, such as using brooms to mobile vacuum sweepers, variation in the frequency, and variation in the areas cleaned, such as cleaning the inside and/or outside.

The general action of metal grinding is prone to generate fugitive metal particulate, particularly if the grinding operation is not properly controlled. Proposed Rule 1430 is needed to reduce metal particulate emissions from metal grinding and metal cutting operations at metal forging facilities to ensure that these operations have the appropriate pollution control equipment, are conducted within an enclosure to ensure fugitive emissions that do not make it to the control device are

contained, and basic housekeeping requirements are followed to ensure any accumulation of metal particulate in around grinding operations is not re-entrained into the air or tracked outside of the facility.

PUBLIC PROCESS

PR 1430 is being developed through a public process. A working group has been formed to provide the public and stakeholders an opportunity to discuss important details about the proposed rule and provide the SCAQMD staff with important input during the rule development process. The working group and interested parties are comprised of a variety of stakeholders including representatives from industry, consultants, environmental groups, community groups, and public agency representatives. The SCAQMD staff has held four (4) working group meetings. To date, the working group has convened on October 7, 2015, September 14, 2016, October 26, 2016, and December 1, 2016. At the request of community representatives, the September and December working group meetings were held in the City of Paramount. A Public Workshop has been scheduled for January 19, 2017 to present the proposed rule and receive public comment.

INDUSTRY PROCESS DESCRIPTION

The following paragraphs provide a general overview of the manufacturing processes and emission sources for the industry source category subject to Proposed Rule 1430. Specifically, SCAQMD staff has provided general operation and emissions source information for metal forging.

Industry Process Description – Metal Forging and Billet Cutting

Forging is a manufacturing process where metal is pressed, pounded, or squeezed under great pressure into high strength parts known as forgings. The process is normally performed hot by preheating the metal to a desired temperature before it is worked. Any metal can be forged, however, some of the most common metals include, carbon steel, alloy steel, stainless steel, very hard tool steels, aluminum, titanium, brass, copper, cobalt, nickel, and molybdenum. These metals are found in billets or ingots that are delivered to the respective forging company. The forging industry is composed of plants that: make parts to order for customers (custom forgings), make parts for their own company's internal use (captive forgings), or make standard parts for resale (catalog forgings). Metal forging creates parts that vary in size, shape, and sophistication. Some of the largest customer markets include: aerospace, national defense, automotive, oil industry, agriculture, construction, and general industrial equipment. The applicable NAICS code for these industries are 332111, Iron and Steel Forging, and 332112 Nonferrous Forgings. The following process description reflects the operational characteristics at metal forging facilities.

Process Description

Metal forging is done because it strengthens the material by sealing cracks and closing empty spaces within the metal. The hot forging process will highly reduce or eliminate inclusions in the forged part by breaking up impurities and redistributing their material throughout the metal work. Forging a metal will alter the metal's grain structure creating a material of increased strength. This makes forging more advantageous than casting or machining. In metal forging operations, a

metal ingot or billet is prepared to be the correct pre-dimensions prior to going through forging. This can include cutting, sawing, grinding, or torch cutting.

Preparation for Forging

Billet Cutting or Sawing

A processed metal billet or ingot is received by the metal forging facility. In order to forge the piece of metal, the metal forging facility may need to reduce the size. This is done by cutting or sawing. At the metal forging facility, the unprocessed metal billet or ingot is place in a sawing machine. The sawing machine is equipped with a blade capable of cutting into a metal billet or ingot at a slow rate. Typically, a continuous flow of metal removal fluid and coolant is supplied where the blade makes contact with the metal. This helps maintain the blade at a cooler temperature with a co-benefit of preventing metal emissions. The metal ingot or billet is cut to the desired dimensions.

Metal Grinding Operations

Irregularities observed on the billet or ingot can be removed via grinding which will create the desired finish and dimensions prior to forging. Based on site visits to the forging facilities, SCAQMD staff identified five categories of metal grinding activities: billet grinding, swing grinding, stand grinding, large and small hand grinding, and torch cutting. Based on observations, all of these activities have the ability to generate fugitive metal particulate if not properly controlled. Each of these metal grinding activities are discussed below.

- *Billet grinding*
  Billet grinding consists of large traveling grinders designed to prepare large billets prior to forging. The billet grinder would traverse the entire length of the billet, going back and forth to create the appropriate dimensions. All billet grinders subject to PR 1430 are vented to baghouses without HEPA filters.

- *Swing grinding*
  Swing grinders are rugged, heavy duty grinders with full lateral movement to prepare medium sized billets. An employee manually operates them. Multiple levels of control were observed ranging from a baghouse with HEPA filters to no air pollution controls.

- *Stand grinding*
  Stand grinders are designed for smaller castings and forging. Mounted in a permanent position, utility grinders have a slotting wheel on one end for reaching into recesses of the material. Multiple levels of controls were observed ranging from venting to a baghouse to not venting to any air pollution controls.

- *Large and small grinding*
  Hand grinding involves using power tools used for preparing, cutting, grinding, and polishing forgings of various sizes. Multiple hand grinding stations can be in one room or one area. Larger forgings utilize larger hand grinders, while smaller forgings utilize smaller hand grinders.


- *Torch Cutting*
  Torch cutting is a process by which metal is preheated with a flame and then oxidized rapidly and removed by a jet of oxygen issued centrally through the preheating flame. Torch cutting in the metal forging industry often occurs using acetylene gas and is used to remove flash (excess metal) from large metal parts that have been forged.

  Basic torch cutting equipment consists of two high-pressure cylinders (one apiece for oxygen and acetylene) and two corresponding pressure regulators. A dual-line hose transfers oxygen and acetylene from the regulators to the torch handle. The torch handle can hold a cutting attachment or cutting tip that controls the thickness of metal being cut, along with the gas pressures set at the regulators. Torches that use oxygen and acetylene reach a working temperature of 5,620 degrees F.

- Heating
  Metal billets or ingot are heated to the desired temperature prior to and/or during the forging process. The heated metal billet or ingot become malleable and are able to be forged. Aluminum alloys are heated to 800 °F, while titanium and nickel are heated to temperatures between 1700 and 2300 °F. Furnaces range in heating capacity and size, but are typical use natural gas for heating. The combustion of natural gas produces NOx, SOx, and combustion related PM emissions. The furnaces are regulated under SCAQMD permit process and are evaluated by SCAQMD staff. NOx is regulated by SCAQMD Rule 1147: NOx Reductions from Miscellaneous Sources for non-RECLAIM facilities. Facilities with NOx emissions that exceed more than 4 tons per year can participate in the SCAQMD RECLAIM program. Non-combustion related emissions, such as emissions generated in the oven space of the furnace produced as result of refractory brick decomposition or off gassing of metals are unknown at this time. Further studies of non-combustion related emissions from metal furnaces are needed.

- Forging
  Forging includes pressing, hammering, rolling, or piercing of metal using a mechanical tool. The type of forges discussed herein are drop forge press, hammer press, and ring rollers. During the forging process, a lubricant is applied to facilitate the release of die and forging material.

- *Drop Forge*
  It is a forging made in a closed or impression die under a drop or steam hammer. A closed die forging is formed to the required shape and size by machined impression in specifically prepared dies that exert three-dimensional control on the workpiece. Excess metal, known as flash, that did not form in the die will be removed in finishing operations. Open die forging involves the repeated striking of metal in a die to get the desired dimension. The metal piece may be rotated or moved around to get the desired shape.

- *Hammer Press*
  It is a forging made by means of a hammer. The action of the hammer is that of an instantaneous application of pressure in the form a sudden blow.

- *Ring Rollers*
  A metal ring preform is rolled between two rolls that move toward each other to form a continuously reducing gap.

- *Lubricant*
  A liquid or power lubricant is applied to facilitate the release of the die and forged metal. The lubricant can be applied multiple times depending on the forging operation. Visible emissions are observed when lubricants contact the die and forged metal. VOC levels in lubricants are regulated by Rule 1144 - Metalworking Fluids and Direct-Contact Lubricants. Similar to non-combustion emissions from the furnace, emissions from heated process need further study.

Finishing Operations

Following the creation of a forging, physical or chemical methods are utilized to produce dimensional corrections to the forging or perform surface treatment. While preparation operations removed irregularities, finishing operations removed flashing and scale deposits. Methods observed include abrasive blasting, buffing/polishing, sawing and cutting, and grinding.

- Abrasive Blasting
  It is a stream of abrasive material that is propelled against a surface under high pressure to alter the surface. The abrasive material can be composed of metal, silica, or other material. The abrasive blasting process is used to smooth or "clean" forged material. Fugitive metal particulates from the forging and shot material may be generated if not adequately controlled. These emissions can be controlled by operating in a blast cabinet or room vented to an air pollution control system. Varying housekeeping measures can be implemented to reduce the accumulation of particles that can become fugitive. SCAQMD permits are required if the volume of the blasting cabinet is greater than 53 ft^3. Abrasive blasting is regulated under SCAQMD Rule 1140: Abrasive Blasting.

- Sawing Cutting
  It is used to remove portions of forged metal that is not desired in the finished product. This can be flash material or parts of the forging that may be needed to be corrected to meet the correct dimensions.

METAL GRINDING AND CUTTING CONTROL STRATEGIES

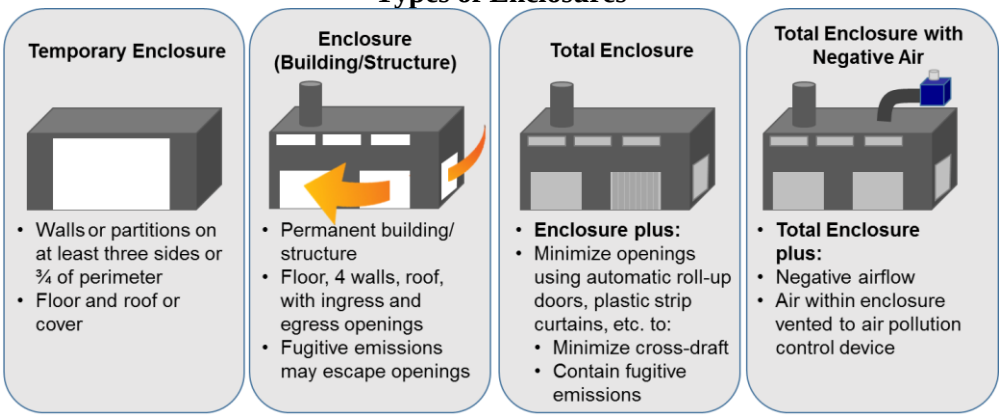
The key emission release points for metal forging facilities' metal grinding are point source emission stacks and fugitive emissions. PR 1430 looks to minimize and control these emissions. Uncontrolled grinding done in the open air is of greatest concern. Emissions are generated at the point of contact where the abrasion or removal of metal occurs. Metal particulates get entrained in the air and are dispersed based on fall-out and dispersion patterns. Additional metal particulates accumulate in metal removal areas. Metal particulates can be tracked out from foot or vehicular traffic. An effective air pollution control system has an effective capture efficiency and effective control technology. Enclosures and capture technology impact the capture rate.

Containment and Collection Strategies

Containment – Enclosures are structures that contain a grinding operation that can prevent or control the generation of fugitive metal dust. The design of the structure can determine the effectiveness of the enclosure and the collection efficiency of any downstream air pollution control devices. Figure 1-7 shows four types of enclosures: Temporary Enclosure; Building; Total Enclosure; Total Enclosure with Negative Air. The following provides a general description of each of these enclosure types.

- A temporary enclosure is a structure comprised of walls or partitions on at least three sides or three-quarters of the perimeter that surrounds with a floor and a roof. As shown in the figure below, one side of the structure is open.
- A building is a type of enclosure that is a permanent containment structure, completely enclosed with a floor, four walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, and run-off), with openings to allow ingress and egress for people and vehicles, but is not free of breaks, cracks, gaps, or deterioration that could cause or result in fugitive metal dust.
- A total enclosure is a permanent containment structure, completely enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, and run-off), with limited openings to allow access and egress for people and vehicles, that is free of breaks, cracks, gaps, or deterioration that could cause or result in fugitive metal dust.
- A total enclosure with negative air that is vented to pollution control equipment is a total enclosure with negative airflow. This total enclosure must meet the industrial ventilation guidelines at each opening and the air within the enclosure is vented to an air pollution control device.

Figure 1-6:
Types of Enclosures



Collection – A collection system allows air and PM emissions to be collected. Designing the air pollution control equipment with ventilation consistent with the Industrial Ventilation Guidelines ensures that the metal particulate is being properly captured and delivered to the pollution control equipment. The collection system can target an emission point, such as a grinding station, or can be for the entire volume of the enclosure. The collection system consists of an intake port, ducting, and a device that creates the target to be under negative air. The collection system needs to be properly maintained in order to maintain expected capture efficiency, which includes proper intake flow rate, duct integrity, and proper positioning of the grinding activity to the intake vent.

Point Source Emission Control Technologies

Baghouses, cyclones, electrostatic precipitators, and wet scrubbers are technologies typically used to control PM emissions from processes. These technologies can be connected in series to further control PM emissions and reduce the wear and tear on downstream processes. A bag leak detection system (BLDS) monitors the performance of baghouse functions by detecting early bag leak or malfunction.

- Baghouses
  Baghouses used for metal grinding operations at forging facilities function like a vacuum cleaner with a fan either blowing air from the grinding source through (positive pressure) the filter or drawing air into (negative pressure) the filter. In either case, air pressure is required to force the air through the filter. The pressure drop is a measurement of this difference in pressure between the clean and dirty sides of the filter. Static pressure gauges can be installed at the inlet and outlet of the fabric filter to determine the unit's pressure drop. As the filter medium becomes clogged with metal dust there is more resistance to air flow, resulting in an increased pressure drop. A baghouse consists of the following components: filter media (for example, fabric, etc.) and auxiliary equipment such as the following; filter media housing, filter cleaning device, collection hopper (metal dust collection drum), and fan. Metal dust layers (dust cakes) deposited on the surface of the bags need to be cleaned periodically to prevent excessive increases of pressure drops across the baghouse, which could result in bag leaks and improper baghouse function.

Baghouses are typically cleaned in sections, with jets of counter-flowing air used to blow captured dust off the filter and into a hopper. For many baghouses installations, the baghouse follows a routine cycle with the pressure drop increasing as the bag becomes coated with dust, and dropping back to a baseline value after it is cleaned. Pressure drop measurements determine if the filter media is being properly cleaned and whether the baghouse is operating to manufacturer specifications. Increased pressure drops may indicate that the filter media is becoming clogged by debris and indicate ineffective capture and control of PM emissions. Low pressure drop values may indicate holes in the filter media or a mechanical failure of baghouse components that also result in ineffective capture and control of PM emissions. Pressure drop monitoring is a useful indicator of baghouse performance, such as, bag leak detection system. Common types of baghouse include reverse-air, pulse-jet and cartridge type baghouse. A reverse air-type baghouses use a low pressure flow of air to break the dust cake and clean the bags of material build-up. Cleaning air is supplied by a separate fan which is normally smaller than the main stream fan, since only one compartment is cleaned at a time. A pulse jet-type baghouse uses a high pressure jet of compressed air to back-flush the bags. Cleaning is performed while the baghouse remains in operation. Cartridge (cylindrical) type filters have pleated, non-woven filter media supported on a perforated metal cartridge. Due to its pleated design, total filtering area is greater than in a conventional bag of the same diameter, resulting in reduced air-to-cloth ratio, pressure drop, and overall collector size. Too heavily loaded cartridges can either be cleaned by a pulse jet compressed air or replaced with new cartridges. Cartridge type filters have high particle collection efficiency of, at a minimum, 99.9 percent, and are usually used for industrial process handing exhaust gas flow rates less than 50,000 cubic feet per minute.

The National Fire Protection Association has special designations for deflagrations from metal dust. Therefore, metal grinding operations that require baghouse emission control technologies choose reliable, economical and effective means of explosion control such as baghouse explosion suppression, containment and venting. Additional information pertaining to these types of protective measures is available in Chapter 8 of the Industrial Ventilation, A Manual for Recommended Practice for Design 28th Edition, published by the American Conference of Governmental Industrial Hygienists, ©2013.

- HEPA Filters

  HEPA filters are classified by their minimum collection efficiency. In general HEPA filters are defined as having a minimum efficiency rating of 99.97% for the removal of 0.3 µm diameter or larger of PM. HEPA filters are best applied in situations where high collection efficiency of submicron PM is necessary, where toxic and or hazardous PM cannot be cleaned from the filter or where the PM is difficult to clean from the filter. Unlike bags or cartridge filters, HEPA filters are not automatically cleaned. When a HEPA filter element becomes loaded with particulate matter, the element is changed out and disposed of as hazardous waste.

  HEPA filters are generally installed as the final component in a PM collection system downstream from other PM collection devices such as a baghouse. HEPA filters require pre-filters to remove large PM for dust concentrations greater that 0.03 grams per centimeter squared (g/cm^2) or 0.06 pounds per feet squared (lbs/ft^2). In metal grinding applications at

forging facilities, mechanical collectors (e.g., cyclones or venturi scrubbers), standard baghouse or cartridge filters may be required to reduce larger diameter PM. Some existing metal grinding operations at forging facilities in the South Coast Air Basin vent to HEPA filters, where, the HEPA filters serve as the final component in a PM collection system downstream from a baghouse.

- Cyclone
  A cyclone, typically used as a pre-cleaner, does not have a blower mounted or connected to induce the particle-laden exhaust stream. Particles in the gas stream are forced to move toward the cyclone walls by the centrifugal force of the spinning gas. Large particles are removed from the gas stream by inertia and small particles may travel along the gas stream out of the cyclone.

CHAPTER 2: SUMMARY OF PROPOSED RULE 1430

OVERVIEW

PROPOSED RULE 1430

OVERALL APPROACH

Proposed Rule 1430 establishes requirements for all metal forging facilities to reduce fugitive metal emissions coming from metal grinding and metal cutting operations. The requirements include the installation and implementation of point source controls at grinding operations, construction and maintenance of a physical containment, and implementation of housekeeping measures. Point source controls are air pollution control devices that contain or filter metal particulate at grinding operations. Physical containments capture fugitive emissions that are not captured by the point source controls. Instead of particulate being entrained in the air, particulate matter remains in the containment until it is cleaned up. Appropriate housekeeping measure requires the cleanup of metal particulate that lands on surfaces in and around facility before it becomes airborne. Due to the variety of control technologies implemented prior to the adoption of PR 1430, interim requirements are established to allow affected facilities time to install and implement the required technology. It should be noted that PR 1430 applies to a previously unregulated source.

PROPOSED RULE 1430

The purpose of PR 1430 is to reduce particulate matter, toxic emissions, and odors from metal grinding and metal cutting operations at metal forging facilities. As previously discussed, metal grinding and cutting operations are currently exempt from SCAQMD permits and are an unregulated sources. PR 1430 will establish standards for metal grinding and cutting options for both point sources and fugitive emission sources. Point sources are addressed through requirements for emission control devices, emission standards, and periodic monitoring. Fugitive particulate emissions are addressed through requirements for total enclosures, housekeeping, and maintenance and repair activities. Additionally, signage, reporting, and recordkeeping requirements are also being proposed to ensure compliance.

Purpose and Applicability – Subdivision (a) and (b)

PR 1430 applies to metal forging facilities in the SCAQMD that conduct metal grinding or cutting operations onsite. The proposed rule does not apply to metal grinding or cutting operations that are conducted under a continuous flood of metal removal fluid, or grinding activities conducted to maintain or repair equipment at the facility. Based on SCAQMD staff site visits and analysis of compliance and permitting data, there are currently 23 facilities in the District that have been identified to meet the applicability of the proposed rule. These facilities located in the Basin typically support the aerospace industry and represent a stationary source category where metal grinding and cutting operations are an integral part of the facility's process. Additionally, as discussed in Chapter 1, data from SCAQMD monitors near Carlton Forge Works and glass plate collection samples at other metal forging facilities have shown that metal grinding and metal cutting operations contribute to ambient levels offsite and to the surrounding community. After the implementation of voluntary emission reduction controls at Carlton Forge Works, significant reductions of various metals, particularly nickel were observed.

Definitions – Subdivision (c)

PR 1430 includes definitions of the following terms used in the proposed rule. Please refer to subdivision (c) of PR 1430 for the definitions:

- Bag Leak Detection System
- Billet Grinding
- Building
- Capture Velocity
- Duct Section
- Effective Zone
- Emission Collection System
- Emission Control Device
- Fugitive Metal Dust
- Hand Grinding
- High Efficiency Particulate Arrestors (HEPA)
- Maintenance and Repair Activity
- Metal
- Metal Cutting
- Metal Forging Facility
- Metal Grinding
- Metal Grinding Operation
- Metal Removal Fluid
- School
- Sensitive Receptor
- Small Hand Grinding
- Stand Grinding
- Swing Grinding
- Temporary Enclosure
- Torch Cutting
- Total Enclosure

Requirements

Subdivisions (d) through (m) establish requirements for enclosures, point source emission limits for particulate matter, filter media for final stage emission controls, source testing, housekeeping measures, maintenance and repair activities, monitoring of emission control devices, recordkeeping, signage, and permit application submittals for existing grinding operations. Appendix 1 establishes requirements for periodic smoke tests to determine capture efficiency for ventilation systems of emission control devices.

Subdivision (d) – Total Enclosures

Upon adoption of PR 1430, metal forging facilities will be prohibited from conducting any metal grinding or metal cutting operations, or small hand grinding outside of a temporary enclosure, building, or total enclosure. As there were no prior requirements for containment of these operations within any type of enclosure, one of the primary objectives of PR 1430 is to have all facilities ultimately conduct metal grinding or cutting within a total enclosure. Metal forging facilities currently conduct metal grinding and metal cutting operations in a variety of enclosures

with some facilities not conducting metal grinding or cutting inside any type of enclosure at all. Therefore, there are two compliance paths depending on whether or not the facility currently conducts metal grinding or cutting inside an existing building as of date of rule adoption.

Within 6 months of rule adoption, facilities that are conducting metal grinding or metal cutting within a building that exists as of date of rule adoption, must conduct all metal grinding and metal cutting operations inside a total enclosure and minimize the release of fugitive metal dust emissions from passages, doorways, and bay doors. This can be accomplished by installing roll-up doors, plastic strip curtains, or vestibules for doors and openings in the total enclosure. Alternatively, a facility may use other methods to minimize the release of fugitive metal dust from the total enclosure that are demonstrated to the Executive Officer to be equivalent or more effective.

For facilities that were not conducting metal grinding or metal cutting in a building prior to date of rule adoption, metal grinding and metal cutting operations are to be conducted within a total enclosure and minimize the release of fugitive metal dust emissions within 12 months of rule adoption. Facilities that do not have existing buildings for metal grinding or cutting operations prior to date of adoption are given additional time to erect a total enclosure as it may take additional time to secure the necessary permits and construct the total enclosure. Until the total enclosure requirements are met, the owner or operator shall conduct metal grinding and metal cutting operations in a temporary enclosure or a building. During this time period, the facility shall limit the amount of fugitive metal dust by more frequent and rigorous housekeeping procedures. In addition to the housekeeping provisions specified for total enclosures, the owner or operator will be required to conduct, after or at the end of each operating shift, wet cleaning or HEPA vacuuming of: floors within 30 feet of metal grinding work station(s), floors within 40 feet of an entrance/exit for the temporary enclosure/enclosure, and floors of temporary enclosure areas where metal grinding or metal cutting operations occur.

All enclosure types shall be designed in a manner that does not conflict with requirements set forth by the Occupational Safety and Health Administration (OSHA) or the California Division of Occupational Safety and Health (CAL-OSHA) for worker safety. To ensure that total enclosures are maintained and effective, the owner or operator shall inspect any temporary enclosure or total enclosure once a calendar month for breaks, cracks, gaps or deterioration that could result in fugitive metal dust. PR 1430 requires prompt repairs of these types of enclosure, which will lower the potential release of fugitive metal particulate dust to the open air. Any breaks, cracks, gaps, or deterioration from any temporary enclosure or total enclosure shall be repaired within 72 hours of discovery. The Executive Officer may approve a request for an extension beyond the 72 hours if the request is submitted before the 72-hour time limit, and the facility can substantiate that the repair will take longer than 72 hours or equipment, parts, or materials needed for the repair cannot be obtained within 72 hours.

To provide further protection to nearby sensitive receptors, PR 1430 will require some facilities to install total enclosure with negative air by venting it to an emission control device that meets the requirements of subdivision (e). An owner or operator that conducts metal grinding or metal cutting operations within 300 feet of a sensitive receptor that is not a school, or within 1,000 feet

of a school, measured from the edge of the total enclosure to the property line of the nearest sensitive receptor or school, shall vent the total enclosure to an emission control device no later than 6 months after a Permit to Construct for the emission control device is issued by the Executive Officer. The distance of 300 feet was selected for sensitive receptors based on the CARB's 2005 "Air Quality and Land Use Handbook: A Community Health Perspective." Modeling and monitoring studies conducted by CARB show that the localized risk of toxic metal particulates such as hexavalent chromium, diminishes significantly at 300 feet. However, the handbook also considered the varying levels of fugitive emissions from a facility and the toxicity of the metal particulates, and a distance of 1,000 feet is also recommended as a precautionary measure. Thus the distance of 1,000 feet was selected in PR 1430 as the protective distance for schools due to the type of sensitive receptors impacted at this location being children. The in-draft velocity of the total enclosure with negative air shall be continuously maintained at a minimum of 200 feet per minute at any opening including, but not limited to, vents, windows, passages, doorways, bay doors, and roll-ups, no later than 6 months after a Permit to Construct for the emission control device venting the total enclosure is issued by the Executive Officer. The in-draft velocity of 200 fpm was selected based on U.S. EPA Method 204 – Criteria for and Verification of a Permanent or Temporary Enclosure.

Subdivision (e) - Metal Grinding and Cutting Emission Requirements

The owner or operator of a metal forging facility shall vent emissions from all metal grinding and metal cutting operations to an emission control device no later than 6 months after a Permit to Construct for the emission control device is issued by the Executive Officer. The emission control device shall not exceed a PM outlet concentration of 0.01 grains of particulate matter per dry standard cubic foot (gr/dscf). Additionally, PR 1430 requires that the final stage of any emission control device be fitted with HEPA filters or filter media rated by the manufacturer to achieve a minimum of 99.97% control efficiency for 0.3 micron particles, and designed in a manner that does not conflict with requirements or guidelines set forth by the OSHA or CAL-OSHA regarding worker safety, and the National Fire Protection Association (NFPA) regarding safety. SCAQMD is considering establishing a lower outlet limit of 0.002 gr/dscf based on the fact that Rule 1155 only applies to baghouses and not HEPA filtration as proposed in PR 1430. SCAQMD staff believes that an outlet emission limit of 0.002 gr/dscf would be more representatives of the total point source control requirement which requires HEPA filtration. SCAQMD staff determined that control technology representing 99.97% control efficiency for 0.3 micron particles was achievable at metal forging facilities as multiple facilities were observed to have installed HEPA filters to control fugitive metal particulates from metal grinding operations.

PR 1430 allows a facility to alternatively fit the final stage of any emission control device with filter media rated by the manufacturer to achieve a minimum of 98% control efficiency instead of 99.97% control efficiency for 0.3 micron particles. To qualify for the alternative, the facility must not vent billet grinding, swing grinding, torch cutting, or metal cutting to the subject emission control device; only operate a combination of 10 or fewer hand grinding units or stand grinding stations to the subject emission control device; and toxic emissions from the emission control device shall not exceed the screening levels identified in Table I – Toxic Air Contaminants in SCAQMD Rule 1401 – New Source Review of Toxic Air Contaminants, or

does not result in a risk of over 1 in a million using the most recent SCAQMD Risk Assessment Procedures for Rule 1401. Billet grinding, metal cutting, swing grinding, and torch cutting typically remove large quantities of metals, and generally have the potential to generate more emissions compared to hand or stand grinding. Therefore, a lower efficiency of 98% is being allowed for the generally lower form of grinding in terms intensity and emissions volume. However, the emissions generated from a significant number of hand grinding or stand grinding units may be equal to or more than the amount of metal being removed from metal grinding or metal cutting methods that remove large quantities of metal. Therefore, the alternative is only applicable to metal grinding operations that have 10 or fewer hand grinding units or stand grinding stations.

All emission control devices are required to be operated at the minimum hood induced capture velocity specified in the most current edition of the *Industrial Ventilation, A Manual of Recommended Practice for Design*, published by the American Conference of Governmental Industrial Hygienists, at the time a permit application is deemed complete with the SCAQMD.

To ensure that the emission collection system for an emission control device will effectively capture metal particulate emissions, within 30 days after rule adoption, the owner or operator of a metal forging facility shall provide permanent visual indicators or markings at all hand grinding, stand grinding, swing grinding, and torch cutting stations that identify the maximum distance metal grinding may occur from the emission control device. Metal grinding activity shall be in front of the hood face and within the area identified by the visual indicators or markings. The air flow shall not be obstructed between the metal grinding operation and the hood for the emission collection system.

PR 1430 also requires the removal of any weather cap installed on any stack that is a source of metal particulate emission within 30 days from rule adoption. The facility is allowed under the proposed rule to instead install a butterfly valve in place of the weather cap. SCAQMD staff has concluded that the weather cap allows for the accumulation of metal particulates that can be dispersed at higher concentrations into the air.

Subdivision (f) – Housekeeping Requirements

The following housekeeping requirements are proposed to minimize fugitive metal particulate emissions. All requirements shall be effective within 30 days after the date of rule adoption.

- For metal grinding operations and metal cutting operations, semi-annual wet cleaning or HEPA vacuum of roof tops that house areas associated with metal grinding or cutting operations, excluding areas associated with: the storage of raw, unprocessed metal containing materials; finished metal-containing products; the storage of metal grinding or cutting waste; and non-metal grinding or cutting activities.
- For metal grinding operations, metal cutting operations, and small hand grinding operations, conduct daily wet cleaning or HEPA vacuum of:
  a. areas where metal containing wastes generated from metal grinding or metal cutting operations are stored, disposed of, recovered or recycled;
  b. floors within 20 feet of metal grinding or cutting work station(s);

c. floors within 20 feet of any entrance/exit point for an existing enclosure or total enclosure; and
d. floors within 10 feet of an emission control device dedicated to metal grinding or metal cutting operations.

- The owner or operator of a metal forging facility that conducts metal grinding operations, metal cutting operations, or small hand grinding shall also implement the following housekeeping measures:
  a. Monthly wet cleaning or HEPA vacuum of ground surfaces of a building or total enclosure areas where metal grinding or metal cutting operations occur.
  b. Store all materials capable of generating any amount of fugitive metal dust including, but not limited to, metal containing waste generated from the housekeeping requirements and the maintenance and repair activities (see below), in sealed containers, unless located within a total enclosure
  c. Compressed air cleaning or dry sweeping operations shall not be conducted within 30 feet of any metal grinding or metal cutting operation, unless the compressed air cleaning operation or dry sweeping is conducted under an emission control device pursuant to subdivision (e).

Subdivision (g) – Maintenance and Repair Activity

As defined in subdivision (c), "maintenance and repair activity" means any of the following activities conducted outside of a total enclosure that generates or has the potential to generate fugitive metal-dust:

a) Maintenance or repair activities on any emission control device that vents metal grinding or cutting operations; or
b) Replacement or removal of any duct section used to vent metal grinding or cutting operations.

It should be noted that PR 1430 does not require maintenance and repair activities to be conducted within any type of enclosure.

No later than 30 days after date of rule adoption, the following measures must be implemented when conducting maintenance and repair activities as defined in paragraph (c)(12).

- No later than one hour after completion of any maintenance or repair activity, the owner or operator of a metal forging facility shall wet clean or HEPA vacuum the floors within 20 feet of where the maintenance or repair activity was conducted.
- Any maintenance and repair activity shall be stopped immediately when instantaneous wind speeds are ≥ 20 mph, unless the activity is being conducted within a building, temporary enclosure, or total enclosure. Maintenance or repair work may be continued to prevent the release of metal particulate emissions.
- Wet clean or HEPA vacuum all metal-contaminated equipment and materials used for any maintenance and repair activity immediately after completion of work in a manner that does not generate fugitive metal dust

Subdivision (h) – Source Tests

PR 1430 will require an annual source test for PM emissions once every 12 months to demonstrate compliance with the particulate emission standard of 0.01 grains per dry cubic foot.

If an annual source test demonstrates that PM emissions were no more than 50% of the PM emission standard of 0.01 gr/dscf, the next text for PM emissions from that emission control device may be performed no later than 24 months after the date of the most recent test. Additionally, a source test for hexavalent chromium and multiple metal emissions will be required once every 48 months to be harmonious with the AB2588 quadrennial cycle for evaluating risk. SCAQMD staff is considering a provision that could allow less frequent source testing for hexavalent chromium and multiple metal emissions.

Facilities with an existing, permitted metal grinding or cutting emission control device in operation before the date of rule adoption shall submit a source test protocol no later than 60 days after the date of rule adoption. Subsequent source test protocols for source tests conducted after the initial source test shall be submitted no later than 90 days prior to the compliance deadline to conduct the next source test. Metal forging facilities with a new or modified metal grinding emission control device with an initial start-up date on or after the date of rule of adoption, shall submit a source test protocol for initial source to demonstrate compliance no later than 30 days after initial start-up. Subsequent source test protocols for source tests conducted after the initial source test shall be submitted no later than 90 days prior to the compliance deadline to conduct the next source test. The initial source test protocol may be used for subsequent source tests if there are no changes.

The pretest protocols shall include the source test criteria of the end user and all assumptions, required data, and calculated targets for testing the following:

- Target particulate mass emission standard;
- Preliminary target pollutant analytical data;
- Planned sampling parameters; and
- Information on equipment, logistics, personnel, and other resources necessary for an efficient and coordinated test.

The owner or operator of a metal forging facility shall conduct the source test for an emission control device no later than 60 days from approval of the source test protocol, unless otherwise approved in writing by the Executive Officer. The owner or operator shall notify the Executive Officer in writing 10 calendar days prior to conducting any source test, and notify the Executive Officer within three business days (Monday through Friday) of when the facility knew or should have known of any source test results that exceeds any of the emission standards. Notifications shall be made to 1-800-CUT-SMOG and followed up in writing to the Executive Officer with the results of the source tests within seven business days of notification.

The Executive Officer may approve a request for an extension of the compliance deadline for source tests to be conducted if the facility can demonstrate that it timely filed a complete source test protocol and associated information, and is unable to meet the deadline due to reasons beyond the facility's control. The request shall be submitted no later than 30 days before the compliance deadline.

The rule lists the following applicable test methods which are required to be conducted representative of typical operating conditions:

- SCAQMD Method 5.1 – *Determination of Particulate Matter Emissions from Stationary Sources Using a Wet Impingement Train*
- SCAQMD Method 5.2 – *Determination of Particulate Matter Emissions from Stationary Sources Using Heated Probe and Filter*
- SCAQMD Method 5.3 – *Determination of Particulate Matter Emissions from Stationary Sources Using an In-Stack Filter*
- CARB Test Method 436 – *Determination of Multiple Metal Emission from Stationary Sources*
- U.S. EPA Method 306 – *Determination of Chromium Emission from Decorative and Hard Chromium Electroplating and Chromium Anodizing Operations – Isokinetic Method*

The use of an alternative or equivalent test method will be allowed, as defined in 40 CFR 60.2, if approved in writing by the Executive Officer, in addition to California Air Resources Board, or the U.S. EPA, as applicable. The reports from source testing conducted shall be submitted to the SCAQMD in 60 days or less after the completion of the test.

Facilities shall use a test laboratory approved under the SCAQMD Laboratory Approval Program (LAP) for the source test methods cited above. Approved labs under LAP can be found on the SCAQMD website. If there is no approved laboratory, then approval of the testing procedures used by the laboratory shall be granted by the Executive Officer on a case-by-case basis based on SCAQMD protocols and procedures.

Subdivision (i) - Monitoring

PR 1430 requires facilities to install, operate, calibrate, and maintain a Bag Leak Detection System pursuant to SCAQMD Rule 1155. The minimum hood induced capture velocity for emission control devices shall also be accurately measured by static pressure once per operating shift using the measurement procedures specified in the most current edition of the *Industrial Ventilation, A Manual of Recommended Practice for Operation and Maintenance*, published by the American Conference of Governmental Industrial Hygienists, at the time a permit application is deemed complete with the SCAQMD, or any more stringent methods required by OSHA or CAL-OSHA. The pressure drop across the HEPA filter of an emission control device shall be continuously measured with a mechanical gauge that is visible and in clear sight of operator or maintenance personnel. The pressure drop across the HEPA filter shall be maintained within -1/2 times to +2 times the inches of water of the value established during the performance test to demonstrate compliance with the emission limits for the emission control device. Monitoring of the pressure drop across the HEPA filters is an indicator that the filters are not clogged or do not have leaks that may compromise its efficacy. For each emission collection system required to be monitored under PR 1430, confirmation of the capture velocity referenced in paragraph (e)(4) and a periodic smoke test shall be conducted at least once every 3 months. The periodic smoke provides a qualitative test for owners and operators to help determine whether cross draft conditions or other operations conducted by the facility are affecting the ability of the emission collection system or hood to effectively capture emissions. Smoke test procedures are outlined in Appendix 1 of the proposed rule.

Subdivision (j) – Recordkeeping

PR 1430 will require records be kept to indicate that the facility is compliant with PR 1430. Required records include:

- Monthly records indicating the weight of metal processed by the facility;
- Monthly records of weight of metal waste collected by the baghouse catch;
- Monthly records of weight of metal waste collected by housekeeping activities;
- Dates when bags for baghouses, cartridges, or HEPA filters are replaced;
- Records of periodic smoke tests, emission control device inspection and maintenance, housekeeping activities, maintenance and repair activities, and dates and times when the specific activity was completed.
- Logs of reports to the facility regarding odors or other air quality related issues that includes the date, time, name and contact information for the person reporting the issue, source of the issue, and how the issue was resolved.
- Records for the Bag Leak Detection System pursuant to SCAQMD Rule 1155.

All records shall be maintained for five years and maintained onsite for at least two years. Records shall be made available to SCAQMD personnel upon request.

Subdivision (k) – Signage

PR 1430 will require facilities to install a sign that says, "TO REPORT ODORS FROM THIS FACILITY, CALL EITHER [*FACILITY CONTACT PHONE NUMBER*] OR THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AT 1-800-CUT-SMOG." The sign shall be installed within 50 feet of each entrance of the facility that is visible to the public, and in a location on each side of the facility that is visible to the public. The sign shall measure at least 16 square feet, and display lettering at least 3 inches tall with text contrasting with the sign background.

Subdivision (l) – Permit Application Submittals for Existing Metal Grinding or Cutting Operations

Facilities shall submit complete permit applications no later than 60 days after date of rule adoption for all construction and/or necessary equipment for emission control devices and total enclosures with negative air required by PR 1430.

Rule 219 Exemption

As noted previously, metal grinding and cutting operations are currently an unregulated source in the Basin and are exempt from requiring written permit under SCAQMD Rule 219. PR 1430 would eliminate this exemption by stating that as of the beginning date of proposed rule adoption, any equipment required under PR 1430 for metal grinding or cutting operations and associated emission control devices are to no longer be exempt from the requirement of a written permit pursuant to SCAQMD Rule 219. As of this writing, rule development for Proposed Amended Rule 219 has already been initiated by SCAQMD staff to incorporate changes and additions, including those that will provide consistency with PR 1430.

Appendix 1 – Smoke Test to Demonstrate Capture Efficiency for Ventilation Systems of an Emission Control Device

Appendix 1 specifies the requirements for periodic smoke tests to demonstrate capture efficiency for ventilation systems of emission control devices for metal grinding or metal cutting operations pursuant to subdivision (d). The periodic smoke test requirement of PR 1430 will not be required if performing such test presents an unreasonable risk to safety. An example of such unreasonable risk to safety includes having to conduct a smoke test at collection sites that would be extremely dangerous, if not deadly, for somebody to work in that collection zone. Refer to PR 1430 for detailed information on smoke test procedures.

CHAPTER 3: IMPACT ASSESSMENT

AFFECTED SOURCES

Based on site visits conducted by SCAQMD staff, there were 23 metal forging facilities identified to be conducting metal grinding and/or cutting operations onsite. The facilities serve a variety of industries including: aerospace, oil industry, and automotive. The types of metal alloy forged are aluminum, titanium, steel, and varying percentages of alloys. The starting point of the forging process begins with metal billets and ingots. The starting material undergoes multiple steps involving three primary steps of preparation, forging, and finishing operations.

Table 3-1: Metal Forging Facilities Identified to Conduct Metal Grinding or Cutting

Facilities Visited		
Foot Axle & Forge Company	Schlosser Forge Facility	Schultz Steel
Carlton Forge Works	Pacific Forge Inc	Weber Metals
Quality Aluminum Forge, LLC	Press Forge Co	Firth Rixson
California Drop Forge	Continental Forge	Ajax Forge
Aluminum Precision Products Inc	California Amforge Corp	Valley Forge Acquisition
American Handforge	Chem Tech Industries	Performance Forged Products
Sierra Alloys Co.	Mattco Forge Inc.	MS Aerospace
Aerocraft Heat Treating Co. Incorporated		

While the identified 23 facilities conduct grinding and/or cutting at their facility, the type and amount vary across the metal forging industry. SCAQMD staff conducted site visits at the 23 facilities and observed a variety of grinding operations paired with a variety of air pollution control technologies.

Table 3-2:
Summary of Number of Facilities with Various Types of Grinding Activities

Findings		Number of Facilities
Grinding		
	Dry Grinding Operations	22
	Wet Grinding Operations	2
Sawing		
	Dry Cutting Operations	2
	Wet Cutting Operations	19
Containment Structures for Grinding		
	Grinding Operations within a Total Enclosure	2
	Grinding Operations within a Partial Enclosure (3 walls)	16
	Grinding Operations Conducted Outside an Enclosure	4

Table 3-3:
Summary of Types of Air Pollution Controls for Various Grinding Activities

Existing Grinding Operations and Air Pollution Controls at Forging Facilities				
Types of Grinding Operation	**Billet**	**Swing**	**Utility**	**Hand**
Total	2	7	9	17
No Control		2	2	9
Vacuum Collection, lubricant, no-baghouse	-	-	2	-
Cyclone	-	-	1	2
Baghouse without HEPA filters	2	4	4	4
Baghouse with HEPA filters	-	1	-	3
Total with Air Pollution Controls	2	5	7	9

EMISSIONS IMPACT

PR 1430 affects 23 metal forging facilities that that conduct metal grinding or cutting operations onsite. Implementation of PR 1430 will reduce both point and fugitive emissions. Quantifying the point source emission reductions is difficult as many sources do not have current source tests and quantifying emission reductions from fugitive sources is difficult. Monitoring data has shown that the implementation of control measures have reduced ambient air concentrations of nickel. The ambient air concentrations of other metal TACs generated from metal grinding and cutting operations will be concurrently reduced as a result of the control measures required under PR 1430.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

PR 1430 is considered a "project" as defined by the California Environmental Quality Act (CEQA), and the SCAQMD is the designated lead agency. Pursuant to the CEQA and SCAQMD Rule 110, the SCAQMD, as lead agency for the proposed project, has determined that an Environmental Assessment (EA) will be required for PR 1430. The Draft EA to be prepared will analyze the potential effects that the project may cause on the environment. In the event that the proposed project may have statewide, regional, or area-wide significance, a CEQA scoping meeting is required pursuant to Public Resources Code section 21083.9(a)(2) and will be held concurrently with the Public Workshop for PR 1430. As part of the CEQA Scoping Meeting, SCAQMD staff will solicit public input from the public on the CEQA evaluation. The Draft EA, upon its release, will be available for a public review and comment period and will contain responses to the comments made at the CEQA Scoping Meeting and comment letters received relative to the EA.

SOCIOECONOMIC ASSESSMENT

A socioeconomic analysis will be conducted and released for public review and comment at least 30 days prior to the SCAQMD Governing Board Hearing on PR 1430, which is anticipated to be heard on March 3, 2017.

DRAFT FINDINGS UNDER CALIFORNIA HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings
California Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the SCAQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing and in the staff report.

Necessity
PR 1430 is needed to further protect public health by reducing toxic and particulate matter emissions from dry metal grinding and cutting operations at metal forging facilities. Metal grinding and cutting operations are currently exempt from SCAQMD permits and are an unregulated source. The general action of metal grinding and cutting is prone to generate fugitive metal particulate, particularly if the grinding or cutting operation is not properly controlled. Proposed Rule 1430 is needed to reduce metal particulate emissions from metal grinding and metal cutting operations at forging facilities to ensure that these operations have the appropriate pollution control equipment, are conducted within an enclosure to ensure fugitive emissions that do not make it to the control device are contained, and to ensure basic housekeeping requirements are followed so that any accumulation of metal particulate around grinding operations is not re-entrained into the air or tracked outside of the facility.

Authority
The SCAQMD Governing Board has authority to adopt PR 1430 pursuant to the California Health and Safety Code Sections 39002, 39650 et. seq., 40000, 40001, 40440, 40441, 40702, 40725 through 40728, 41508, and 41700.

Clarity
PR 1430 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency
PR 1430 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions or state or federal regulations.

Non-Duplication
PR 1430 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference
By adopting PR 1430, the SCAQMD Governing Board will be implementing, interpreting or making specific the provisions of the California Health and Safety Code Section 41700 (nuisance), and Federal Clean Air Act Section 112 (Hazardous Air Pollutants) and Section 116 (Retention of State authority).

COMPARATIVE ANALYSIS

Health and Safety Code section 40727.2 requires a comparative analysis of the proposed rule with any Federal or District rules and regulations applicable to the same source. See Table 3-1 below.

Table 3-4: Comparison of PR 1430 with NESHAP for Area Source Standards for Nine Metal Fabrication and Finishing Source Categories

Rule Element	PR 1430	NESHAP from Area Source Standards for Nine Metal Fabrication and Finishing Source Categories
Applicability	Facilities who own or operate a metal forging facility where metal grinding or metal cutting operations are conducted onsite	Nine metal fabrication and finishing source categories, including iron and steel forging facilities
Outdoor Metal Grinding	Prohibition of metal grinding in the open air	- None
Total Enclosures	- Conduct all metal grinding or metal cutting operations within a total enclosure that for containment and minimization of fugitive emissions - Inspect total enclosures once a month - Implement total enclosures with negative air if metal grinding operations are located within 300 feet of sensitive receptor or 1,000 feet of a school	- None
Metal Grinding and Cutting Emissions	- Vent metal grinding and metal cutting emissions to an emission control device meeting 0.01 grains/dscf [*SCAQMD staff considering 0.002 gr/dscf*] - Emission control devices shall be equipped with filters that achieve a 99.97% control efficiency on 0.3 micron size particles; alternatively equip with filters that meet 98% control based on lower volume grinding operations - Requirements for design and operation per *Industrial Ventilation Manual* - Inspect, operate, and maintain each emission control device pursuant to manufacturer specification	- Capture PM emissions from dry grinding and dry polishing and vent the exhaust to a cartridge, fabric, or HEPA filter - Does not include hand-help or bench-scale devices
Housekeeping Requirements	- Semi-annual cleanings of total enclosure roof tops - Daily wet cleaning or HEPA vacuum of areas subject to metal grinding or metal cutting dust - Monthly cleanings of floors of enclosures where metal grinding or metal cutting occurs - Store fugitive metal dust material in	- Minimize excess dust in the surrounding areas to reduce metal fugitive hazardous air particulates

Rule Element	PR 1430	NESHAP from Area Source Standards for Nine Metal Fabrication and Finishing Source Categories
	containers - Days precipitation may be counted as a cleaning	
Maintenance and Repair Activity Requirements	- Wet mop or vacuum the floors within 20 feet of where maintenance or repair activity was conducted within one hour after completion - Cease maintenance and repair activity if winds $\geq$ 20 mph - Clean by wet wash or vacuum all metal-contaminated equipment immediately after completion	- Operate equipment according to manufacturer's specification
Source Test	- Annual requirement to source test emission control devices for PM - Option to switch to source test once every 24 months with a source test of 50% or less of PM emission standard - Source test once every 48 months for multiple metals and hexavalent chromium - Submit source test protocol and notify the SCAQMD in a timely manner - Conduct source test within 60 days source test protocol approval	- None
Monitoring	- Install, operate, inspect, and maintain a BLDS system pursuant to SCAQMD Rule 1155 - Minimum hood induced capture velocity shall be measured by static pressure once per operating shift - Continuously monitor the pressure drop across an add-on air pollution control device to ensure the press drop is within -1/2 times to +2 times the inches of water of the value established during the performance test - Periodic smoke test of each emission collection device once every 3 months	- None
Recordkeeping	- Monthly records of metal processes, metal waste generated from baghouse catch, and metal waste generated from housekeeping - Dates when bags for baghouses or HEPA filters are replaced - Logs of report to the facility regarding odor or other air quality related issues - Maintain smoke test results, emission control device inspection and maintenance, housekeeping activities, and maintenance and repair activities - Maintain BLDS records	- None
Signage	- Install signage that lists contact information in the event of odors	- None

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REFERENCES

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